# 3. EQUIVALENCIAS

# 3.1. GIC $\Rightarrow$ AA

$$\begin{array}{l} \text{GIC} & \text{AA} \\ G = (N, \Sigma, P, S) \quad \Rightarrow \quad A = (Q, \Sigma, \Gamma, \delta, q_0, Z_0, \emptyset) \\ & \begin{cases} Q = \{q_0\} \\ \Gamma = N \cup \Sigma \\ \delta\left\{\delta(q_0, \epsilon, A) = \{(q_0, \alpha) \: / \: A \to \alpha \in P\} \right. & \forall A \in N \\ \delta(q_0, \sigma, \sigma) = \{(q_0, \epsilon)\} \end{cases} & \forall \sigma \in \Sigma \end{array}$$

#### Universidad de Santiago de Chile Facultad de Ingeniería Departamento de Ingeniería Informática Ingeniería Civil en Informática Teoría de la Computación

## $3.2. AA \Rightarrow GIC$

#### $\mathbf{A}\mathbf{A}$

$$A = (Q, \Sigma, \Gamma, \delta, q_0, Z_0, \emptyset)$$

#### GIC

$$\begin{split} G &= (N, \Sigma, P, S) \\ N &= \{S\} \cup \{[p, Z, q] \, / \, p \, , q \in Q \, , Z \in \Gamma\} \\ P &: \\ S &\to [q_0, Z_0, q] \qquad \forall \, \, q \in Q \end{split}$$

$$(q_1, X_1 \ X_2 \ ... \ X_m) \in \delta(q, a, Z) \Rightarrow [q, Z, q_{m+1}] \rightarrow a \ [q_1, X_1, q_2] \ [q_2, X_2, q_3] \ ... \ [q_m, X_m, q_{m+1}]$$

### Ejemplo:

$$A = (\{q_0, q_1\}, \{0, 1\}, \{X, Z_0\}, \delta, q_0, Z_0, \emptyset)$$

$$\delta(q_0, 0, Z_0) = \{(q_0, XZ_0)\}$$

$$\delta(q_0, 0, X) = \{(q_0, XX)\}$$

$$\delta(q_0, 1, X) = \{(q_1, \epsilon)\}$$

$$\delta(q_1, 1, X) = \{(q_1, \varepsilon)\}$$

$$\delta(q_1, \varepsilon, X) = \{(q_1, \varepsilon)\}$$

$$\delta(q_1, \varepsilon, Z_0) = \{(q_1, \varepsilon)\}$$

### Ejercicio propuesto:

$$A = (\{q_0, q_1, q_2\}, \{a, b\}, \{A, B, Z_0\}, \delta, q_0, Z_0, \emptyset)$$

$$\delta(q_0, a, Z_0) = \{(q_1, AZ_0)\}$$

$$\delta(q_0, b, Z_0) = \{(q_1, BZ_0)\}$$

$$\delta(q_0,\,\epsilon,\,Z_0)=\{(q_2,\,\epsilon)\}$$

$$\delta(q_1, a, A) = \{(q_1, AA)\}$$

$$\delta(q_1, b, B) = \{(q_1, BB)\}$$

$$\delta(q_1, a, B) = \{(q_1, \varepsilon)\}\$$

$$\delta(q_1, b, A) = \{(q_1, \varepsilon)\}\$$

$$\delta(q_1,\,\epsilon,\,Z_0)=\{(q_0,\,Z_0)\}$$